

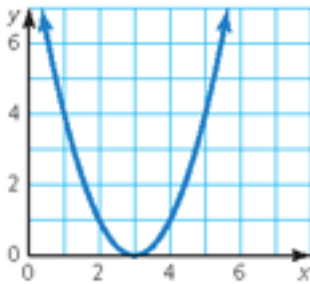
Name: _____ Date: _____ Band: _____
Algebra 2

Algebra 2 Practice Midterm

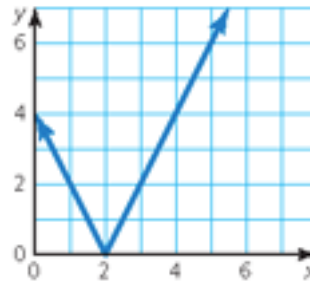
Functions

Find the domain and range of the function represented by the graph.

1.



2.



Evaluate the function when $x = -2, 0,$ and $5.$

3. $f(x) = x^2 + 6$

4. $f(x) = -2x + 9$

5. $f(x) = -3 + 4x^3$

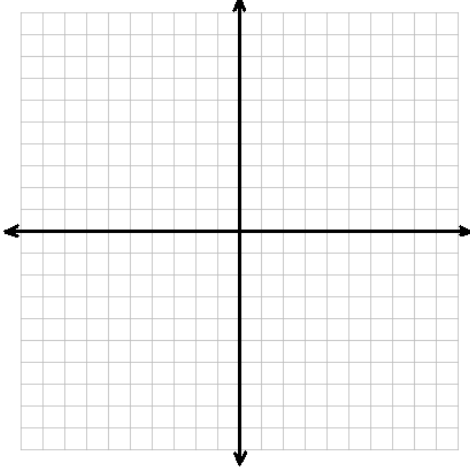
Find the value of x so that the function has the given value.

6. $m(x) = 4x^2 + 15; m(x) = 31$

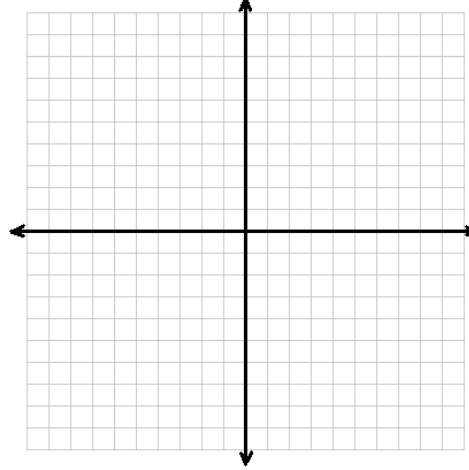
7. $k(x) = 6x - 12; k(x) = 18$

Graph the function and its parent function. Then describe the transformation.

8. $g(x) = |x + 2| - 1$

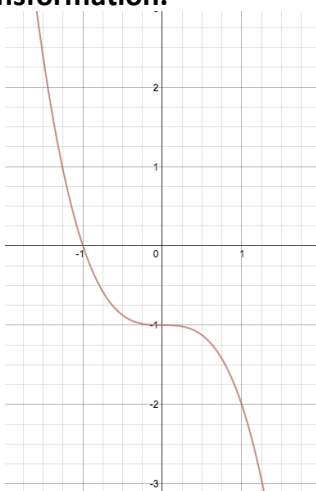


9. $f(x) = -2x^2 + 6$

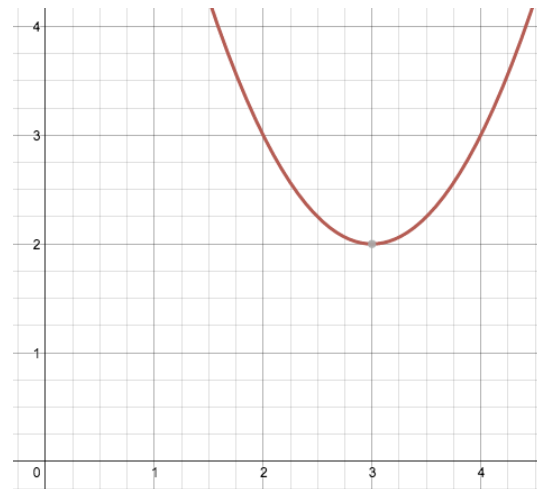


Identify the parent function of the graph. Then write a function that represents its transformation.

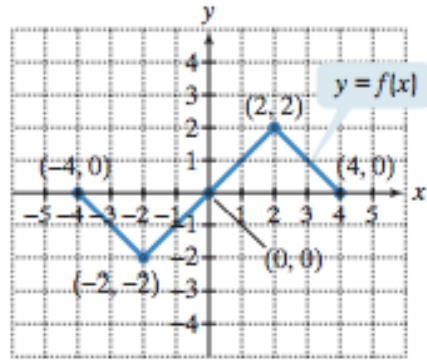
10.



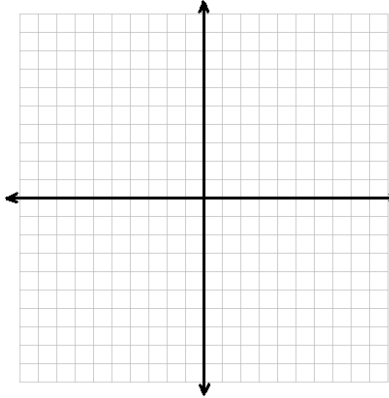
11.



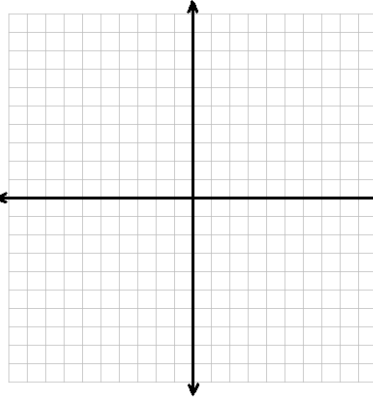
Use the graph of $y = f(x)$ to graph each function g .



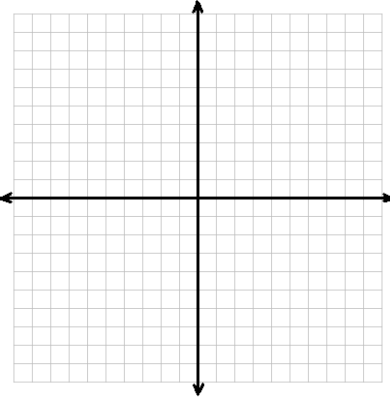
12. $g(x) = f(-x)$



13. $y = 2f(x + 2)$



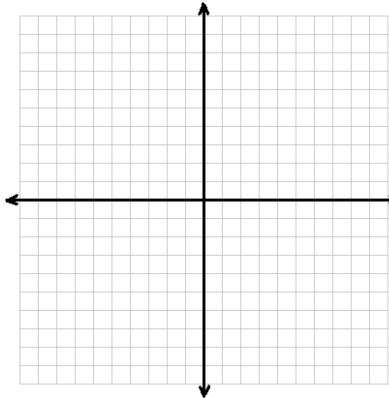
14. $g(x) = -f(x) + 1$



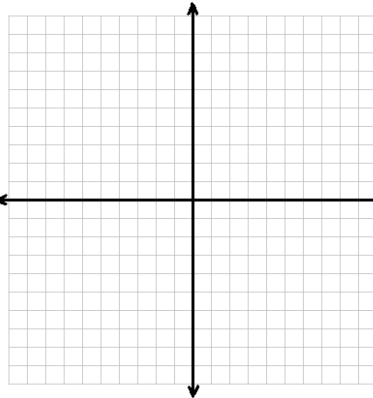
Graphing Quadratic Functions

Find the vertex, axis of symmetry, y -intercept, and x -intercepts of each function. Then graph the function.

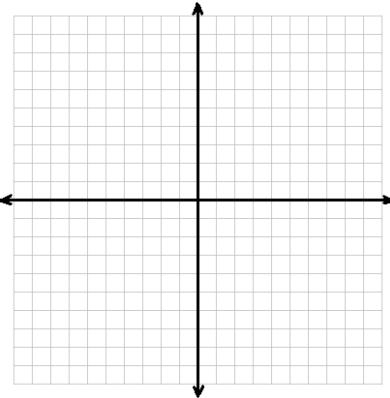
15. $f(x) = 2(x + 1)^2 - 3$



16. $y = (x + 1)(x - 3)$



17. $g(x) = -2x^2 + 8x + 7$



Writing Quadratic Functions

18. Write $y = x^2 - 6x + 11$ in vertex form.

19. Write $f(x) = x^2 - 4x - 1$ in vertex form.

Write the quadratic function of the parabola in the table in...

x	$f(x)$
0	24
-7	3
-6	0
-5	-1
-4	0
-3	3

20. Vertex form

21. Intercept form

22. Standard form

Solving Quadratic Equations & Imaginary Numbers

Solve the equation using square roots.

23. $(p - 4)^2 = 49$

24. $4(x - 1)^2 + 2 = 10$

25. $2(x + 2)^2 - 5 = 8$

Solve the equation by factoring.

26. $0 = x^2 + 6x + 9$

27. $2w^2 - 16w = 12w - 48$

Solve the equation by completing the square.

28. $x^2 + 6x + 3 = 0$

29. $t^2 - 8t - 5 = 0$

Solve the equation using the Quadratic Formula.

30. $6x^2 - 21 + 1 = 0$

31. $2x^2 + 4x = 30$

Find the discriminant of the quadratic equation and describe the number and type of solutions of the equation.

32. $0 = x^2 - x + 6$

33. $0 = 4n^2 - 4n - 24$

34. $0 = 2x^2 - 20x + 50$

Simplify.

35. i^{23}

36. i^{46}

37. $(12 + 4i) - (3 - 7i)$

38. $(2 - 15i) - (4 + 5i)$

39. $(3 - 2i)(4 + i)$

40. $(7 + 5i)(8 - 6i)$

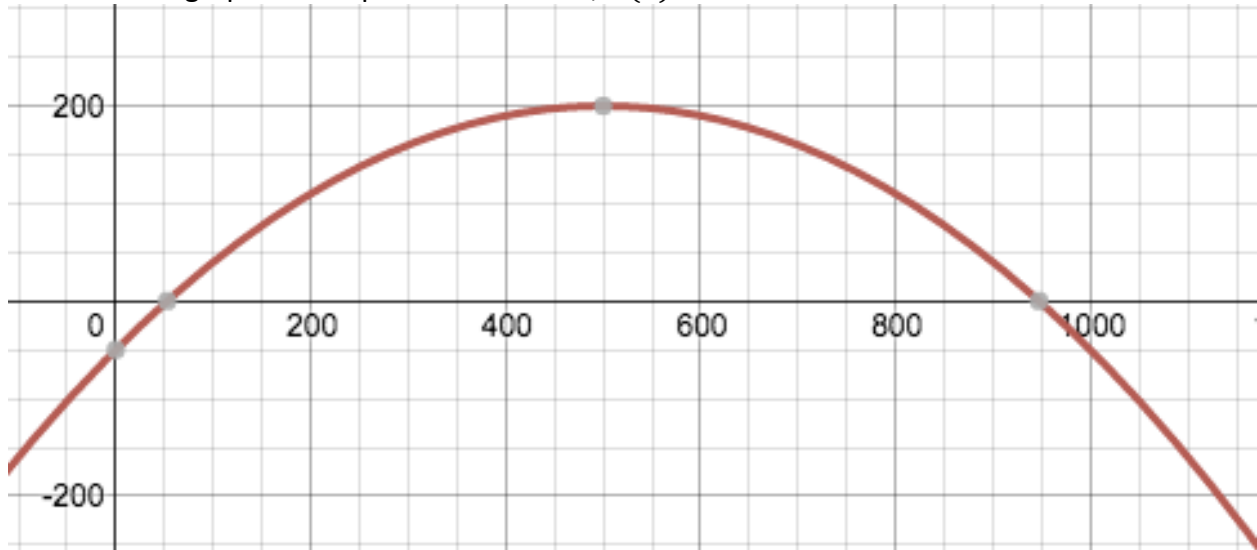
41. $\frac{5}{1+i}$

42. $\frac{5+2i}{3-2i}$

43. $\sqrt{-18}$

Quadratic Applications

44. A pizza restaurant sells pizzas (duh). The owners are doing some math (after high school what what) to figure out how many pizzas should be sold to maximize profits. The graph below represents the profit, $P(x)$, in dollars, earned by selling x pizzas. Answer the questions below based on the graph of the quadratic function, $P(x)$.



A. How many pizzas do the owners need to sell to earn a maximum profit? How do you know?

B. What is $P(0)$? What does this value mean in terms of the real-life problem? Why does this sometimes happen in real life?

C. If the pizza restaurant wants to make a profit of about \$100, approximately how many pizzas should be sold?

D. What is the minimum number of pizza that must be sold in order for the restaurant to have a *positive* profit?

E. What is the maximum profit? How do you know?

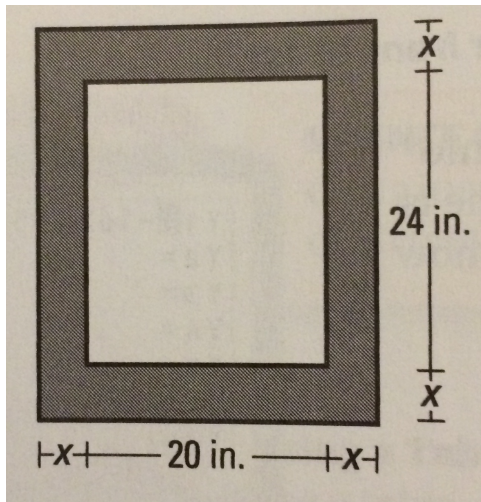
45. The function $h(t) = -16t^2 + 40t + 4$ models the height, $h(t)$, in feet of a ball t seconds after being tossed into air by a juggler.

A. What is $h(0)$? What does $h(0)$ represent in real-life in this word problem?

B. What is the maximum height of the ball? How do you know?

C. How long is the ball in the air? How do you know?

46. You are creating a metal border of uniform width for a rectangular wall mirror that is 20 inches by 24 inches. You have 416 square inches of metal to use. What is the greatest possible width x of the border?



47. You have a rectangular vegetable garden that measures 42 feet by 8 feet. You want to double the area of the park by expanding the length and width as shown. What is the value of x ? What are the dimensions of the new garden?

